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EXAMINER				
WU, IVES J				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
07/17/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/595,460

**Applicant(s)**

YUN, JANGSHIK

**Examiner**

IVES WU

**Art Unit**

1797

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 14-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29 is/are allowed.
- 6) ☒ Claim(s) 14, 16-19 and 22-26 is/are rejected.
- 7) ☒ Claim(s) 15, 20, 21, 27 and 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB08)
- Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

(1). The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the humidity controller 442 installed on a clean gas outlet 432 as in instant claim 21 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “804 in Figure 14” has been used to designate both 1st vortex room and exhaust gas pipe. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

- (2). The disclosure is objected to because of the following informalities: On page 6, line 30 in Specification, it recites: a 1<sup>st</sup> liquid drain holes 922. It would be 822 as shown in the Figure 14.

Appropriate correction is required.

***Claim Objections***

- (3). **Claims 19, 20** are objected to because of the following informalities:

In claims 19 and 20, it recites: comprising. Markush terminology requires the phrase "selected from the group consisting of" and the connector "and" between the last two members. See MPEP 2173.05(h). Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- (4). **Claims 17, 22** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 17 and 22, the phrase "et al" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "et al"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(5). **Claims 14, 17-19, 23-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosen (US 7077886B2).

As to wet type air cleaner utilizing a centrifugal impeller comprising: a body 407 in which a centrifugal impeller 408 rotates the sucked air, to which a housing and a gas passage cylinder 413 are mounted so that a vortex having a centrifugal force lengthwisely passes by a predetermined distance in **independent claim 14**, Rosen (US 7077886B2) discloses emission control device and method of operation thereof (Title). It relates to an emission control device to remove particulates from a gas and, more particularly to an emission control device that operates by adding moisture to the gas and subsequently removing moisture from the gas along with particulates. Still more particularly, it relates to a scrubber with a fan located therein (Col. 1, line 10-15). As is shown in the Figure below, it has housing 4; blower (fan) 42; passage 10; which meet the limitations as claimed.

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FIGURE 1

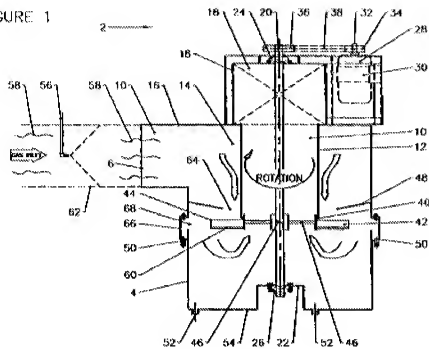
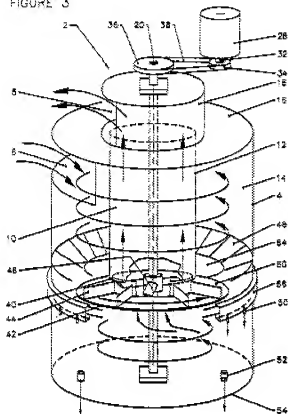


FIGURE 3



As to the body having an annular 1<sup>st</sup> vortex room formed between the housing 409 and the gas passage cylinder 413 and a 2<sup>nd</sup> vortex room formed in the gas passage cylinder 413 in **independent claim 14**, as shown in the Figures above the annular passage which reads on the 1<sup>st</sup> vortex room, the passage 10 within the concentric section reads on 2<sup>nd</sup> vortex room.

As to a gas suction duct 405 mounted to the front side of the body 407, through which the air is moved; and a liquid tank 401 communicated with the gas suction duct 405 for supplying the washing water to the gas suction duct 405 from a liquid atomizer 403 through the Venturi tube 402 in **independent claim 14**, as shown in the Figure above, it has the moisturizer 56 in the gas inlet pipe. Moisturizers are **nozzles** that are capable of creating a finely divided mist (Col. 2, line 65-66). The amount of water injected into the gas stream is such that a wet environment is created with sufficient free water carried by the gas (Col. 3, line 10-12). It would have a water tank in order to moisturize the gas. It is well known that Venturi tube is also Venturi nozzle, it

would be obvious to include the use of Venturi nozzle for the moisturizer because teaching for nozzles of Rosen (US 7077886B2) is genus.

As to over driver 436 utilizing with various transfer means including an oil surface friction transmission, a gear transmission et al for increasing the rotation speed of a centrifugal impeller 408 in **claim 17**, Rosen (US 7077886B2) discloses the belt 38, pulleys 34, 36 to drive the shaft 20 of the fan as shown in the Figure of Rosen (US 7077886B2) above.

As to a scrubbing room 406 located on the gas suction duct 405 for scrubbing gas pollutants with the stream of a fine particular liquid mist in **claim 18**, as shown in Figure above the section before the gas inlet passage 10 would be a scrubbing section.

As to an axial fan, a climbed fan and sirocco as a centrifugal impeller 408 for suctioning the stream of the wet air in **claim 19**, Rosen (US 7077886B2) discloses the blower 42 to be fan (Col. 2, line 25). It would be obvious to include the use of an axial fan as claimed.

As to a centrifugal impeller 408 utilizing with a turbine impeller for generating centrifugal vortex stream in a gas-liquid centrifugal separator 407 in **claim 23**, as shown in the Figure of Rosen above, the outer blades 44 reads on the limitations as claimed.

As to wet type air cleaner utilizing a centrifugal impeller with a liquid atomizer and a gas-liquid centrifugal separator for disposing an electric motor outside of a gas-liquid centrifugal separator comprising: an electric motor 433 installed on the outside of a gas-liquid centrifugal separator 407, an over driver 436 connected with an electric motor 433, an impeller shaft 435 rotatably fixed with an over driver 436, a centrifugal impeller 408 rotatably fixed on an impeller shaft 435, and a bearing 434 supported for a centrifugal impeller 408 on a gas passage cylinder 413 in **claim 24**, as shown in the Figure above, moisturizer 56, emission control device 2, the motor 28, pulley 34, belt 38, shaft 20, bearing 24, blower 42, gas passage 10, which read on the limitations as claimed.

As to an impeller shaft 435 formed with a gas passage inside for passing a clean gas through inside of a shaft in **claim 25**, as shown in the Figure above, the shaft 20 and gas passage 10, which reads on limitations as claimed.

As to wet type air cleaner utilizing a centrifugal impeller with a liquid atomizer and a gas-liquid centrifugal separator for scrubbing dust and harmful gases at a remote distance comprising: a flexible hose 604 connected with a liquid atomizer 401 in front of an gas-liquid

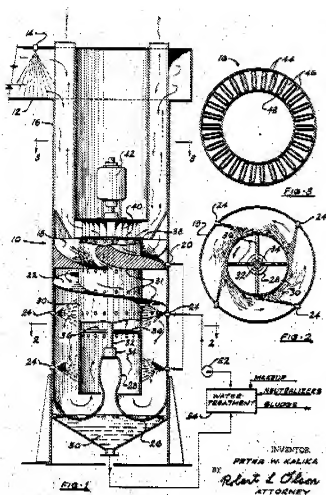


centrifugal separator 407 through a gas inlet duct 405 in **claim 26**, the intended use for scrubbing dust and harmful gases at a remote distance is not considered as limitations of instant claim. it would have a flexible hose connected with liquid atomizer for moisturizer 56 in front of emission control device 2 through gas inlet 62 in order to provide humidity.

(6). **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rosen (US 7077886B2) in view of Kalika (US 3358413).

As to spiral grooves 416 formed on the outside surface of a gas passage cylinder 413 for generating vortex stream of wet gas on the basis of labyrinth effect and separating washing water from gas on the basis of centrifugal force in claim 16, Rosen (US 7077886B2) discloses the annular baffles at lower end of annular passage as shown in the Figure 4 above. Rosen **does not teach** the spiral grooves as claimed.

However, Kalika (US 3358413) **teaches** wet scrubber for dirty gases (Title). As illustrated in the Figure below, the spiral baffle 22 which reads on limitations as claimed.



The advantage of spiral baffles is to further stabilize and ensure the spiral flow pattern (Col. 2, line 16-17).

Therefore, it would have been obvious at time of the invention to install the spiral groove disclosed by Kalika for the annular passage in the device of Rosen in order to attain the advantage cited herein above.

#### *Allowable Subject Matter*

(7). **Claims 15, 21, 27-28** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Claim 29** is allowed.

The following is a statement of reasons for the indication of allowable subject matter:  
the turbine connection to drive the fan overcomes the prior arts cited above.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu  
Art Unit: 1797  
Date: July 6, 2009

/DUANE SMITH/  
Supervisory Patent Examiner, Art Unit 1797